Fall 2014 Newsletter

Motor Control, Cognition, & Neuroimaging Laboratory at Penn State

Volume 1, Issue 1

December 15, 2014

Thank you research participants!

A big thank you to everyone who participated in our research studies over the past few months! I enjoyed meeting you and getting to know you. Without your participation, our research would not be possible. In this newsletter we would like to tell you about what your efforts have helped us to learn. Stay posted for future publications on this work!

- Sara Barth, Study Coordinator

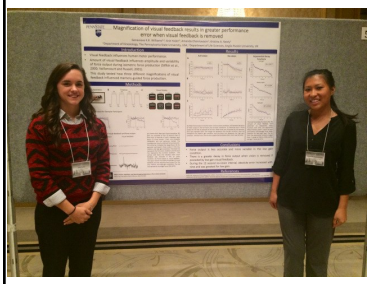
What we do

The MCCN Lab investigates how brain structure and function, cognitive ability, and personality traits influence the control of reaching and grasping movements.

Our research uses systems neuroscience techniques including:
- Functional magnetic resonance imaging (fMRI)
- Structural MRI
- Kinetic movement analysis
- Kinematic movement analysis
- Assessments of cognition and processing speed
- Genetics

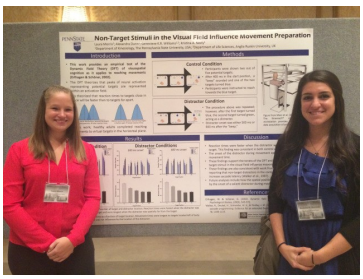
Research News

Four undergraduate research assistants worked with Dr. Kristina Neely to analyze and interpret data collected from June to September, 2014. Amanda Chennavasin and Arie Yoder worked on projects related to precision grip force and Laura Morris and Nicki Morreale worked on projects related to reaching movements. These students presented preliminary results at an international conference in October.



Our most recent grip force study examined different magnifications of visual feedback influence visually and memory-guided force production. Participants produced grip force against a custom-made fiber optic force transducer. Force output was displayed in real time on a television screen. Participants were instructed to match a moveable bar, which represented their force, to a stationary white target bar. After several seconds, visual feedback was removed and the moving force bar disappeared. Participants were instructed to continue producing the same amount of force in the absence of visual feedback. The results showed that the lowest magnification of visual feedback elicited the greatest amount of error when visual feedback was removed.

Our most recent reaching study was conducted using our virtual-reality aiming apparatus. Participants completed a distraction experiment in which two gray targets appeared in the workspace. After a visual and auditory "go" cue, one of the targets turned blue, while the second target remained gray. Participants were instructed to aim for the blue target and ignore the gray target. In the 'distractor' condition, the gray target turned green as the participant was reaching towards the blue target, serving as a distraction. In both tasks, reaction times were fastest when the two targets were adjacent to one another and increased as the distance between targets increased. These findings demonstrate that non-target stimuli in the visual field influence movement preparation.



Upcoming Studies!

January: New reaching study for individuals with & without ADHD ages 18-25

March: New GLAMM study for healthy adults ages 60-85

Happy Holidays from the MCCN Lab!

- Dr. Kristina Neely, Lab Director
- Sara Barth, Study Coordinator
- Alex Dunn, Graduate Student
- Nicki Morreale, Schreyer's Honors College Student
- Samantha Blouch, Amanda Chennavasin, Travis Mason, Laura Morris, Kaylee Raudenbush, Sarah Rojas, Arie Yoder

Looking forward to seeing you in 2015!